

REMARKS

I. STATUS OF THE CLAIMS

Claims 1-5, 7-8 and 11 are pending in the present application. Claims 1 and 11 are the independent claims.

Claims 6, 9 and 10 have been cancelled without prejudice to or disclaimer of the subject matter recited therein.

Claims 1, 7 and 11 have been amended. Proper support for the amendment to claim 11 can be found at the specification at least at paragraph [0029] and at FIG. 5A. No new matter is believed to have been added.

II. IN THE TITLE

The title of the invention has been amended to clearly describe the invention to which the claims are directed. Applicant respectfully requests that the new title be entered.

III IN THE SPECIFICATION

FIG. 6 has been added and the specification has been amended to show the subject matter expressed in the claims as requested by the Examiner. Accordingly, Applicants respectfully request that the objection to the claims be withdrawn. Furthermore, Applicant's believe that no new matter has been added since FIG. 6 and the amendment to the specification are supported by the language in the claims.

IV. THE REJECTION OF CLAIMS 1-3 AND 5 UNDER 35 U.S.C. §102(B) AS BEING ANTICIPATED BY MITANAGA ET AL. (US 5,923,997).

Applicants respectfully traverse this rejection for at least the following reasons.

Independent claim 1 recites, amongst other novel features, a display device comprising a display region, a driving region, a first plurality of thin film transistors in the display region, a second plurality of thin film transistors in the driving region and primary crystal grain boundaries in the polysilicon substrate in the display region, wherein the primary crystal grain boundaries are inclined to a first direction of current flowing from source to drain of each of the first plurality of

thin film transistors at an angle of -30° to 30° and wherein the primary crystal grain boundaries are inclined to a second direction of current flowing from source to drain of each of the second plurality of thin film transistors at an angle of 30° to 150°.

Mitanaga discloses a semiconductor device having a TFT formed on an insulating substrate, the semiconductor having a source, drain and channel regions. Mitanaga further discloses a relationship between crystal growth direction and the source-drain direction along which the channel current flows. Mitanaga also discloses grain boundaries and their arrangement with respect to the source-drain direction (column 14, lines 56-65). Therefore, although Mitanaga discloses grain boundaries and their arrangement with respect to the source-drain direction, Mitanaga is silent with respect to a display device having a display region, a driving region, a plurality of thin film transistors in the driving and display regions as well as the angles of the crystal grain boundaries as recited in independent claim 1.

Accordingly, Applicants respectfully assert that the rejection of claim 1 under 35 U.S.C. § 102(b) should be withdrawn because Mitanaga fails to teach or suggest each feature of independent claim 1, as amended.

Furthermore, Applicants respectfully assert that dependent claims 2-3 and 5 are allowable at least because of their dependence from claim 1, and the reasons set forth above.

V. THE REJECTION OF CLAIMS 4 AND 6-11 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MITANAGA IN VIEW OF YAMAZAKI ET AL. (US 2002/0043662).

Applicants respectfully traverse this rejection for at least the following reasons.

As noted above, Mitanaga fails to teach or suggest the features recited in independent claim 1.

Yamazaki fails to cure the deficiencies of Mitanaga for at least the following reasons.

Yamazaki discloses method for increasing the orientation of a crystalline semiconductor film obtained by crystallizing an amorphous semiconductor film, and providing a TFT, which uses the crystalline semiconductor in an active layer (paragraph 0011).

Yamazaki however is silent with respect to a display device having primary crystal grain boundaries inclined to a first direction of current flowing from source to drain of each of the first plurality of thin film transistors at an angle of -30° to 30° and wherein the primary crystal grain boundaries are inclined to a second direction of current flowing from source to drain of each of

the second plurality of thin film transistors at an angle of 30° to 150°, as recited in independent claim 1.

Accordingly, Applicants respectfully assert that the rejection of claims 4 and 6-10 under 35 U.S.C. §103(a) should be withdrawn because neither Mitanaga nor Yamazaki, whether taken singly or combined teach or suggest each feature of independent claim 1.

Furthermore, Applicants respectfully assert that dependent claims 4 and 6-10 are allowable at least because of their dependence from claim 1, and the reasons set forth above.

Independent claim 11 recites, amongst other novel aspects, a driving region, a plurality of thin film transistors in the driving region, primary crystal grain boundaries in the polysilicon substrate in the driving region and secondary crystal grain boundaries in the polysilicon substrate in the driving region, wherein the primary crystal grain boundaries are inclined to a direction of current flowing from source to drain of each of the plurality of thin film transistors at an angle of 30° to 150° and the secondary crystal grain boundaries are substantially perpendicular to the current flowing from the source to the drain.

As noted above, Mitanaga discloses grain boundaries and their arrangement with respect to the source-drain direction (column 14, lines 56-65 and FIGS. 5B and 5C) but fails to teach or suggest primary crystal grain boundaries in the polysilicon substrate in the driving region and secondary crystal grain boundaries in the polysilicon substrate in the driving region, wherein the primary crystal grain boundaries are inclined to a direction of current flowing from source to drain of each of the plurality of thin film transistors at an angle of 30° to 150° and the secondary crystal grain boundaries are substantially perpendicular to the current flowing from the source to the drain, as recited in independent claim 11.

Yamazaki discloses a method for increasing the orientation of a crystalline semiconductor film obtained by crystallizing an amorphous semiconductor film, and providing a TFT, which uses the crystalline semiconductor in an active layer (paragraph 0011) but is silent with respect to the primary crystal grain boundaries and the secondary crystal grain boundaries as well as their orientation with respect to the current flow from the source to the drain.

Therefore, Yamazaki fails to cure the deficiencies of Mitanaga.

Accordingly, Applicants respectfully assert that the rejection of claim 11 under 35 U.S.C. §103(a) should be withdrawn because neither Mitanaga nor Yamazaki, whether taken singly or combined teach or suggest each feature of independent claim 11, as amended.

VI. CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited and possibly concluded by the Examiner contacting the undersigned attorney for a telephone interview to discuss any such remaining issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 503333.

Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS:

In the Office Action the Examiner objected to claims 6 and 11 indicating that the subject matter expressed in the claims was not shown in the drawings. In order to overcome these objections, a new figure is submitted herewith. In FIG. 6, the driving and the display regions are illustrated as originally recited in claims 1 and 6. Accordingly, no new matter is believed to have been added and approval of these changes to the Drawings is respectfully requested.